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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,904	07/05/2001	Tatsuo Fukui	109686	1427

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EXAMINER

STOCK JR, GORDON J

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

09/897,904

FUKUI, TATSUO

Examiner

Art Unit

Gordon J Stock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 30 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8 is/are rejected.
- 7) ☒ Claim(s) 7 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTQ-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Applicant's arguments, see page 8, filed 30 April 2003, with respect to Figure 1 have been fully considered and are persuasive. The objections to Figure 1 have been withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1,2 and 8** are rejected under 35 U.S.C. 102(b) as being anticipated by **Takahiko (JP 08-115874)** (cited by applicant--translation).

As for **claims 1, 2, and 8**, Takahiko in a position deviation measuring optical system discloses the following: an irradiation optical system for irradiating the measurement mark with a beam of irradiation; image forming optical system; an imaging device for capturing the image of measurement mark; an image processing device for measuring positional deviation in alignment between the first mark and second mark; an image field adjustment mechanism for adjusting, in a plane perpendicular to the optical axis, a position of an image field for capturing the image of the measurement mark by said imaging device, while maintaining a size of image field (Drawing 1; Drawing 6; Drawing 7; page 2, paragraphs 8-11; page 3, paragraphs 13 and 15); wherein said image field position adjustment mechanism comprises a field stop provided on said irradiation optical system; an imaging device position adjustment mechanism for adjusting a position of said imaging device; said field stop and an imaging surface of said imaging device

are disposed in optically conjugate positions, and said imaging device position adjustment mechanism adjusts the position of said imaging device in accordance with the field stop positional adjustment effected by said field stop position adjustment mechanism (Drawing 1; 6a; 54; 53; 8; 18; 12 and 13; page 3, paragraphs 13-18); wherein said image field position is so adjusted that at least one set of areas which are symmetric with respect to the center of the image field is selected and an amount of rotationally asymmetric aberration for every selected area may be symmetric, in a predetermined focal area in which a focused area is included, with respect to the axis which passes through the center of said image field and which is perpendicular to a detecting direction of said positional deviation in alignment (Drawings 3-4, 7; page 1, paragraph 5; page 3, paragraphs 16-17).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 2, and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sugaya et al. (5,754,299)**.

As for **claims 1-2, and 8**, Sugaya teaches in an inspection apparatus for alignment: an irradiation optical system; an image forming optical system; an imaging device for capturing the image; an image processing device for measuring positional deviation; an image field position adjustment mechanism; wherein said image field position adjustment mechanism comprises a

field stop provided on said irradiation optical system, a field stop position adjustment mechanism for adjusting a position of said field stop, in a plane perpendicular to the optical axis, and an imaging device position adjustment mechanism for adjusting a position of said imaging device, said field stop and an imaging surface of said imaging device are disposed in optically conjugate positions, and said imaging device position adjustment mechanism adjusts the position of said imaging device in accordance with the field stop positional adjustment effected by said field stop position adjustment mechanism (col. 6, lines 50-67; col. 7, lines 1-20; Fig. 19; cols. 24-25; col. 26; lines 1-10); wherein said image field position is so adjusted that at least one set of areas which are symmetric with respect to the center of the image field is selected and an amount of rotationally asymmetric aberration for every selected area may be symmetric, in a predetermined focal area in which a focused area is included, with respect to the axis which passes through the center of said image field and perpendicular to detecting direction of said positional deviation in alignment (col. 32, lines 1-25). As for marks, Sugaya discloses street and line marks for a wafer mark (Fig. 20); and discloses that the embodiment may be used for overlay using a main scale and vernier (col. 26, lines 65-67; col. 27, lines 1-10). Therefore, it would be obvious to one skilled in the art at the time the invention that a first mark and second mark comprising a street and line pattern for overlay measurements utilize a mark comprising a first mark, main scale, and a second mark, a vernier.

6. **Claims 3-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sugaya et al. (5,754,299)** in evidence of **Iwanaga et al. (5,920,398)**.

As for **claims 3-6**, Sugaya discloses everything as above (see **claim 1**). In addition, Sugaya discloses adjusting field position on the basis of an asymmetric focus characteristic of the

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pattern image; wherein said image field position adjustment mechanism adjusts the image field so that the asymmetric focus characteristic of the pattern exhibits a characteristic that is symmetric with respect to the axis which passes through the center of the visual field and perpendicular to a direction in which the positional deviation is detected; wherein said field position adjustment mechanism adjusts position on basis of asymmetric focus characteristic curve of the pattern image; wherein image field position is adjusted that focus characteristic on a signal intensity difference at a stepped position on both sides of each line mark or space mark, a periodicity (Fig. 8), may have a characteristic which is symmetric with respect to the axis which passes through the center of the visual field and perpendicular to a direction of the positional deviation (Figs. 3-6; Figs. 9-12; Figs. 14-17; col. 4, lines 35-60; col. 5, lines 1-30; col. 13; lines 35-67; col. 14, lines 1-45; col. 15, lines 15-67; col. 17, lines 40-67). In addition, Iwanaga in a surface position detecting method teaches using an asymmetric focus curve to calculate focus correction (col. 12, lines 5-25).

Allowable Subject Matter

7. **Claims 7 and 9** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to **claim 7**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in an optical positional deviation detecting apparatus the focus characteristic curve of a value Q , in combination with the rest of the limitations of **claims 7 and 9**.

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Response to Arguments

8. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U.S. Patent 4,687,322 to Tanimoto et al.

U.S. Patent 6,163,376 to Nomura et al.

U.S. Patent 6,538,740 to Shiraishi et al.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

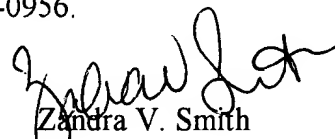
Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 308-7722

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (703) 305-4787. The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



gs
July 14, 2003


Zandra V. Smith
Primary Examiner
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